

**Testimony Submitted to**  
**United States Senate**  
**Committee on Commerce, Science & Transportation**  
**Sub Committee on National Oceans' Policy Study**

**on**

**Invasive Species and the Ballast Water Management Act**

**-- June 15, 2005 --**

**Testimony of Joel C. Mandelman, Vice President & General Counsel**

**I. The Need for Ballast Water Treatment Legislation**

A. We commend Senator Stevens and Senator Inouye for taking the lead in sponsoring the Ballast Water Management Act and in moving the legislation closer to passage. The invasive species problem requires a prompt solution. Invasive aquatic nuisance species threaten water quality, power plants, municipal water treatment systems and ships throughout the United States. Prompt Congressional action is required to solve what is an acknowledged, and worsening, worldwide environmental and public health problem

One of the major barriers to the development of treatment technologies has been the absence of definitive invasive species legislation and regulations. Without those clear guideposts, many prospective investors have been reluctant to commit venture capital to the small businesses that are the principal developers of the technological solutions for this problem. Ironically, passage of effective invasive species legislation has been delayed, in major part, by concerns that treatment technology was unavailable and that ship owners, therefore, could not meet the proposed law's ballast water treatment requirements.

*That concern is no longer valid.*

Nutech O3 has worked closely with British Petroleum, since 1998, to develop an effective means of killing dangerous aquatic nuisance species found in all ships' ballast water operating on the high seas; we anticipate having comparable data, and results, for vessels operating on the Great Lakes next Spring. Testing of our ozone injection technology began in 2000 with the installation of a prototype system on the a 125,000 Dead Weight Ton (DWT) BP oil tanker, *T/V Tonsina*. This ship regularly transports Trans Alaska pipeline oil from Valdez, Alaska to refineries in Washington and California. Testing has continued, both on-board ship and by the University of Washington at its Merrowstone Test Facility.

All of the on-board ship and laboratory testing was conducted by an independent team of scientists and engineers from the University of North Carolina-Wilmington, the University of Washington, the University of Western Washington, the Department of the Interior-Fish & Wildlife Service, the Smithsonian Institution's Environmental Research Center in Edgewater, Maryland, ENSR, Inc. of Greeley, Colorado, Parametrix Inc. of Corvallis, Oregon and Northeast Technical Services of Olmsted Falls, Ohio.

The Research Team's Report was released in June 2002. Their Report demonstrated that the injection of ozone into a ship's ballast water is an effective means of killing unwanted invasive species without damaging the quality of the receiving water into which the treated water is discharged. The Report's primary conclusion was that ozone could serve as an effective biocide in the removal of invasive species from sea water but (inferentially) that the technology required refinement before it would be commercially viable.

The Ballast Water Research Team's Report also proved that ozone, when it is injected into sea water, forms various bromine compounds. This total Residual Oxidant (TRO) typically decays over a 24 to 48 hour period after injection.

An earlier Report, prepared by the La Que Institute for Corrosion Technology, of Wrightsville Beach, North Carolina, demonstrated that ozonated water will not increase the rate of corrosion of a ship's hull or impact the ship's sacrificial zinc anode. It should also be noted that the introduction of ozone and bromine compounds to the ballast water inhibits oxygen thriving colonies of bacteria that exist in weld areas. Those bacterial colonies are a major cause of corrosion.

B. Last year, Congress earmarked \$1.7 million for the development of an advanced, more technologically efficient and affordable version of our technology. With the assistance of the National Oceanic & Atmospheric Administration, Nutech will install an advanced version of this ozone injection technology on a second BP oil tanker, the 140,000 DWT, *T/V Prince William Sound*, in September 2005. This improved version of this technology will cost approximately 65 percent less to build and install than the original version, the installation time will be sharply reduced and it may be possible to perform most (if not all) of the installation work without taking the ship out of service. All of this testing will be completed no later than the Spring of 2006 and, if favorable weather conditions exist, it may be completed before that time.

NOAA has established an Advisory Panel, to work with Nutech and the Ballast Water Research Team, to assist in the development of the Testing Protocol that will be used during the *Prince William Sound* test series. This Advisory Panel includes representatives from the U.S. Coast Guard, the U.S. Navy, the Fish & Wildlife Service, the Environmental Protection Agency, the California State Lands Commission, the Washington State Department of Fish & Wildlife, the Chamber of Shipping of America and British Maritime Technologies, a major ship design and engineering firm.

Nutech is confident that it has developed an effective and affordable solution to the invasive species problem. Therefore, we strongly urge that the Commerce Committee, and the Senate, promptly enact the Inouye Stevens Ballast Water Management Act, with the changes that we recommend.

C. Nutech's Ballast Water Treatment System will pay for itself, in operational cost savings,

within 12 to 18 months of its installation. Our cost savings estimate is based on data published by the Coast Guard, in its March 2003 ANPRM. *This data showed that a deep ocean ballast water exchange costs a ship owner between \$16,000 and \$80,000, per exchange. This is a shipping industry trade association estimate.* Since the typical tanker or freighter has a useful life exceeding 30 years and, typically, conducts at least one ballast water exchange a month, the savings will run into the millions of dollars over the ship's life.

## **II. Suggested Changes to the Ballast Water Management Act**

### **Amendment # 1 - Speeding Up the Compliance Timetable**

Premised on the availability of effective treatment technology we, therefore, think that it would be reasonable to move up the implementation date from the distant schedule contained in the IMO Treaty and carried over into S. 363. Under our recommendation, all affected ship owners would have 18 months after the date on which the Coast Guard certifies the availability of an effective treatment technology to install it on their ships.

Since we believe that our technology, and those of some of our competitors, can be installed without taking the ship out of service or, at most taking it out of service for only a few days, the prompt installation of many treatment technologies will not impose a financial burden on ship owners while rapidly improving the quality of local water supplies.

### **Amendment # 2 - Encouraging the Installation of Ballast Water Treatment Technology Before the Bill's Initial 2009 Compliance Date**

Invasive species pose an increasing threat to water quality. Therefore, Congress should take all available steps necessary to encourage ship owners to install ballast water treatment equipment at the earliest practicable date, prior to the bill's initial planned implementation date of 2009.

Therefore, the technology incentive provisions of the Ballast Water Management Act, carried over from the IMO Treaty, need to be significantly modified. The application process was too cumbersome and it is limited to only 5 or 6 ships a year. *As currently drafted, those provisions will discourage ship owners from participating in a program in which the maximum number of ships, and ship owners, should be encouraged to participate.*

We recommend that the Commerce Committee take the Coast Guard's STEP Program, issued in January 2004, and expand its more generous scope (more generous in comparison to the IMO Treaty's parallel provisions ) to allow a far larger number of ships, operated by the same ship owner, to participate in the experimental technology program.

More importantly, in terms of encouraging ship owners to participate in the STEP Program, we recommend that anyone installing approved technology prior to the bill's mandatory implementation date be permanently grandfathered, i.e. permanently deemed to be in compliance with statutory or regulatory treatment standards even if the standards become more stringent in later years. For both reasons, we believe that this proposal will offer ship owners the necessary economic incentives to install treatment technology well ahead of the bill's stretched out compliance deadlines.

Without this proposal, the invasive species problem will unnecessarily worsen before the shipping industry starts to use the technological solutions now available to it. With them, it will be far more likely that ship owners will take the lead in installing treatment technology before the contemplated compliance dates, instead of waiting until the last possible minute to do so. With it, technology vendors will be encouraged to bring new treatment technologies to the market more quickly. And investors, who have mostly remained on the sidelines, waiting for regulatory agencies, and the Congress, to establish the rules of the game, will be encouraged to bring venture capital to the market which, until now, they have been very reluctant to do.

### **Amendment # 3 - Additional Means of Verifying Compliance With Ballast water Treatment Requirements**

In terms of enforcing the bill's treatment requirements, it is essential that a ship captain's ability to prove to the Coast Guard that the ship has complied with those requirements be temporally and economically feasible. This is especially critical if proof of treatment must be presented each time a ship enters a port and discharges ballast water or has done so inside the Exclusive Economic Zone.

Conducting microbe counts is not a practical or economical means of proving that compliance especially on a multiple trip, or multiple port entry basis. Such counts are very expensive. They require trained, scientific personnel. Expensive laboratory equipment is required. Moreover, it can take several days to transport ballast water samples from a ship to a laboratory. The microbe count could rapidly increase (or decrease) during shipping, thus providing inaccurate results to an enforcement agency. For all of these reasons, such counts cannot routinely be conducted on board a ship.

Moreover, it is very doubtful that taking a few ballast water samples, even from widely dispersed areas of a ballast tank is a statistically accurate method for proving that the ballast water has been treated to a specific microbe per cubic meter of water standard. A typical oil tanker carries 12 to 18 million gallons of ballast water in a ship that has ballast water compartments running the entire length, width and height of a ship that may be 900 or more feet long a hundred or more feet wide and 100 or more feet high. It is highly improbable that a few gallons of water taken randomly from those ballast tanks will be representative of the content of the ship's ballast water. This is especially so since it is practically impossible to take samples from tanks immediately above the bottom of the ship's hull.

While it may be desirable to such sampling annually, or on some other periodic basis, to establish another reference point for gauging the effectiveness of a treatment system, it is not practical to do so during every port entry. Our testing has proven that the presence of a Total Residual Oxidant (TRO) is an effective and scientifically accepted methodology for proving that ballast water has been properly treated. This identical methodology has been in use, for decades, to prove that drinking water has been properly chlorinated (or, these days, ozonated) pursuant to the Safe Drinking Water Act's Surface Water Treatment Regulations.

It has also been suggested that after the Coast Guard certified that a given technology meets the established treatment standard, that the ship's captain certifying that the approved equipment was in operation for the required time period be accepted as proof of compliance

Testing for the required level of a TRO is easily performed. Nutech, for example, can provide customers with off-the-shelf, automated, equipment that will measure TRO levels as the System is in use. This is less difficult, and less time consuming, than testing a swimming pool's water for the proper level of chlorine. Use of this testing procedure is not limited to ozone injection treatment technology. This technique should work as well with other biocides producing bio-chemical residuals. *Thus, requiring that the Coast Guard (and EPA) accept TRO levels as proof of compliance would not give Nutech a competitive advantage over other biocide based technologies.*

In any event, nothing in draft amendment #3 would preclude the Coast Guard (or EPA) from conducting microbe counts on an annual basis as a back up means of certifying or recertifying the effectiveness of any given ballast water treatment technology, assuming that accurate sampling methodology can be established. Finally, this amendment requires that state regulatory agencies also accept, as conclusive, whatever test data are acceptable to the Coast Guard as proof of compliance with parallel state regulations.

#### **4. Ballast Water Management Act Should be the Exclusive Legislative Authority for Regulating Ballast Water Discharges**

We understand the Chamber of Shipping of America has urged the adoption of an amendment that would make it explicitly clear that the Ballast Water Management Act provided the sole legislative authority for mandating the treatment, and regulating the discharge, of ballast water. This proposal would prevent conflicting regulation of such discharges under the Clean Water Act. We strongly support adoption of that proposal.

We also support the Chamber's proposal that Congress preempt this area of environmental regulation and bar the enforcement of any conflicting, or more stringent, state ballast water treatment regulations such as those enacted by the Michigan and California.

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If additional information is desired, please contact Joel C. Mandelman, Vice President & General Counsel, Nutech O3, Inc. at 703 288 4694.

## **Amendment # 1 S. 363**

Delete the Implementation Schedule, page 21 line 3 through page 22, line 4 and insert, in lieu thereof, the following:

**(3) Implementation Schedule** - Paragraph (1) applies to vessels in accordance with the following schedule and procedures.

**(D) Effective Date** - The effective date of this Act shall be January 1, 2007.

**(E) Vessels Required to Treat Ballast Water** - All covered vessels in operation on, or after, the effective date of this Act shall be required to install ballast water treatment equipment no later than 18 months after the Coast Guard certifies that at least one technology or process meets the treatment standards set forth contained in section (f).

**(F) Excluded Vessels** - The following vessels shall not be required to install ballast water treatment equipment:

(i) Any vessel that initially entered service 25 years, or more, prior to the effective date of this Act.

(ii) Any vessel of less than 1,000 Gross Registered Tons.

(iii) Any vessel that, in the ordinary course of its operations, does not carry ballast water.

(iv) Combat vessels of the Navy and the Coast Guard unless they are required to treat ballast water pursuant to regulations subsequently adopted by the Navy or the Coast Guard. Vessels that primarily carry cargo for military use shall be required to treat their ballast water in accordance with section (f).

(v) Comparable vessels of foreign Navies.

**Amendment # 2 - S. 363**

1. Strike from Page 23, line 3 through page 24, line 7 all of the section entitled "Delay of Application for Vessel Participating in Promising Technology Evaluations", and insert, in lieu thereof, the following:

**(5) Experimental Testing & Approval of Ballast Water Treatment Equipment - Permanent Use Testing and Certification of treatment Equipment**

**(A) In General** - The Coast Guard shall continue in effect the Shipboard Evaluation & Testing Program (STEP Program) established in the Coast Guard's Navigation and Vehicle Inspection Circular, NVIC 01-04, of January 2004, subject only to the revisions set forth in subsection (B). The STEP Program shall not be discontinued or otherwise modified, except as provided herein, without the express authorization of the Congress.

**(B) Modifications to NVIC 01-04** - The Coast Guard's NVIC 01-04 shall be modified, as follows:

(1) Any ship entering the Exclusive Economic Zone of the United States including the waters of Alaska, and also including the Great Lakes, the Hudson River, the Mississippi River or any tributary thereof, shall be eligible to participate in this program irrespective of the country in which it is registered or in which its owner is incorporated or organized.

(2) Each vessel owner or operator wishing to participate in the STEP Program shall file with the Coast Guard a single application for each technology it wishes to use. That application shall apply to as many as fifteen (15) ships of the same or similar design, irrespective of the ship's ballast water capacity provided the vessel regularly operates carrying not less than 500,000 gallons of ballast water.

(3) A ship owner or operator may have in the STEP Program no more than twenty-five (25) vessels of all designs and sizes, using differing technologies, at any one time.

(C) **Authorization** - There is authorized \$100,000,000 for Fiscal Years 2006 and 2007 to pay for the establishment and operation of such test facilities, and the hiring of personnel, as the Coast Guard determines may be required to fully operate the STEP Program.

(D) **Use of Independent Testing Laboratories Required** - The Coast Guard is directed to employ independent, non-governmental laboratories and personnel for the purpose of evaluating and certifying ballast water treatment technologies and equipment at least until such time as the Coast Guard has established, equipped and staffed a sufficient number of Government operated test facilities so that any technology or equipment vendor submitting equipment for testing and certification has that process completed within sixty (60) calendar days of its submission to the Coast Guard.

(E) **Standing to Sue** - Any equipment vendor whose equipment or technology is rejected for use in the STEP Program, or which the Coast Guard or the Environmental Protection Agency, refuses to certify, or decertifies, for permanent use on board a vessel, shall have standing to file suit, pursuant to the provisions of the Administrative Procedures Act, for injunctive relief or such other relief as is authorized by federal law. Such suit may be filed in the district court in which the aggrieved party maintains its principal place of business or in the United States District Court for the District of Columbia.

(F) **Applicability** - The foregoing provisions supersede any conflicting provisions of NVIC 01-04, or any subsequent modifications thereto, and supersede any regulations heretofore issued by the Coast Guard, or by any other agency of the United States, pertaining to the testing of any type of ballast water treatment equipment or process in any pilot or experimental testing program or for permanent installation on any vessel subject to this Act.



### **Amendment #3 - S. 363**

On page 20, after line 13 insert a new sub-section (2) and renumber the existing sub-sections accordingly:

#### **(2) Verification of Compliance Methodologies -**

(a) The Coast Guard shall conduct, not more than once in any 12 month period, an actual microbe count after the operation of a vessel's ballast water treatment technology, during the vessel's regular operation, to determine if the ballast water treatment equipment is treating the ballast water to the standard set forth in section (1).

(b) For purposes of determining compliance at all other times during a vessel's actual operation the Coast Guard, the Environmental Protection Agency, and all state regulatory agencies, shall accept as conclusive proof of the required treatment of the vessel's ballast water:

- (i) An actual microbe count demonstrating compliance with the standards set forth in section (1) that is conducted in accordance with generally accepted scientific testing methodologies; or,
- (ii) The presence of Total Residual Oxidant (TRO), or other residual chemical in the treated ballast water, at a level consistent with the killing of the organisms required to be removed from that ballast water, that is conducted in accordance with generally accepted scientific testing methodologies;
- (iii) Any other verification standard or methodology that is scientifically acceptable to the Coast Guard that is conducted in accordance with generally accepted scientific testing methodologies; or,
- (iv) In lieu of any of the foregoing, the Coast Guard, the Environmental Protection Agency and any state regulatory agency may accept as proof of operational compliance with the treatment requirements of section (1) that (I) the treatment equipment was certified by the Coast Guard as meeting the treatment standards of section (1) and (II) the vessel's captain affidavit and supporting written documentation showing that the vessel's ballast water treatment system was in operation for the period of time required pursuant to its

certification by the Coast Guard, to treat the ballast water to the standards required by section (1).

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(b) For purposes of determining compliance at all other times during a vessel's actual operation the Coast Guard, the Environmental Protection Agency, and all state regulatory agencies, shall accept as conclusive proof of the required treatment of the vessel's ballast water:

- (i) An actual microbe count demonstrating compliance with the standards set forth in section (1) that is conducted in accordance with generally accepted scientific testing methodologies; or,
- (ii) The presence of Total Residual Oxidant (TRO), or other residual chemical in the treated ballast water, at a level consistent with the killing of the organisms required to be removed from that ballast water, that is conducted in accordance with generally accepted scientific testing methodologies;
- (iii) Any other verification standard or methodology that is scientifically acceptable to the Coast Guard that is conducted in accordance with generally accepted scientific testing methodologies; or,
- (iv) In lieu of any of the foregoing, the Coast Guard, the Environmental Protection Agency and any state regulatory agency may accept as proof of operational compliance with the treatment requirements of section (1) that (I) the treatment equipment was certified by the Coast Guard as meeting the treatment standards of section (1) and (II) the vessel's captain affidavit and supporting written documentation showing that the vessel's ballast water treatment system was in operation for the period of time required pursuant to its certification by the Coast Guard, to treat the ballast water to the standards required by section (1).